

I may add that my protractions have brought me almost right in latitude, but about ten miles too far west in longitude, taking Livingstone's map as correct.*

J. THOMSON.

Note on Mr. Thomson's Hypsometrical Observations, by Mr. J. Coles, Map Curator, R.G.S.

The means of the heights obtained from the barometer readings, temperatures, and boiling points, taken by Mr. Thomson, are as follows:—

The mean result obtained from barometer readings and temperatures is 2610 feet above sea-level. The mean result obtained from boiling points of thermometers Nos. 17460 and 8039 (corrected for errors by Kew Certificates) is 2618 feet above sea-level.

The barometer reading for the lower station (sea-level), in calculating the above, is 29·9 inches, and the temperature used is 79° of Fahrenheit. These quantities have been obtained from 'Die Verbreitung der Wärme auf der Oberfläche der Erde, von H. W. Dove'; 'Grundzüge der Meteorologie, von H. Mohn'; and 'Handy Book of Meteorology, by Alexander Buchan.' The thermometers Nos. 15007 and 15111 are not known to me, and as they give widely different results from the other two thermometers (which I have corrected for the error given in the Kew Certificates), it is probable that they have some error, without the knowledge of which it would be impossible to obtain true results. As compared with some of the observations taken by former travellers, the results of Mr. Thomson's most nearly coincide with those of Dr. Livingstone, and differ most from those of Mr. Stanley. The following are the heights (above sea-level) assigned to Lake Tanganyika by the following travellers:—

Thomson	..	..	..	..	..	..	..	..	..	{ 2610 feet.
										{ 2618·2 „
Livingstone	..	..	..	..	..	..	..	..	..	2624 „
Cameron	..	..	..	..	..	..	..	..	..	2710 „
Stanley	..	..	..	..	..	..	..	..	..	2756 „

The barometer referred to by Mr. Thomson is one of Captain George's and was supplied to the Expedition by this Society.

Pishin and the Routes between India and Candahar
By Major-General Sir MICHAEL A. BIDDULPH, R.A., K.C.B.

(Read at the Evening Meeting, February 9th, 1880.)

Map, p. 272.

1. THE VALLEY OF PISHIN AND THE BASIN OF THE LORAS.

Introduction.—The student of the physical aspect of countries may understand with what delight and enthusiasm we found ourselves at Quetta early in November 1878, on the far side of that screen of mountains which had of late years been known only to a few. We had a taste for geographical studies, and movement and exploration were, happily, in the direct path of duty. Our reading, and our experience of many mountain lands, had not prepared us for features so novel and

* We have received the following later news of Mr. Thomson, by telegram from Dr. Kirk:—"Zanzibar, March 1st. Thomson left Ujiji sixteenth January. Returns by Uguha, Uhehe. Expected Kilwa, June. Lukuga now a torrent. Lake fallen eight feet."



MAP OF THE
UPPER BASIN OF THE LORA
AND PISHIN VALLEY

constructed from
the surveys & reconnaissances
executed by officers attached to the forces

SOUTHERN AFGHANISTAN

1879

collated with Major Wilson's map
by W.I. Turner.

so singular as those which met us at the outset. Before proceeding to describe our explorations, we must, at the risk of having to repeat what others have before depicted, dwell on some forms which are constantly recurring, and go far to make up every South Afghan landscape.

To give exact ideas of scenery, it is often illustrative to describe by contrast. Thus we may observe that neither in Norway, nor in the Alps, nor in the outer Himalaya do we find anything at all approaching the vast plains and huge sterile skirts or glacis of the mountains, which are the marked feature in Southern and Western Afghanistan.

In all European systems the valleys are for the most part either V-shaped or formed like the letter U. The former character is most frequent in the outer Himalaya, and where the ranges of mountains have for countless ages been subject to the furrowing of an abundant rainfall. The U-shaped valleys are often those covered for a great portion of the year by snow. Plains are, however, the leading feature in the country we were exploring, while valleys and glens characterise the systems referred to with which we were familiar.

It was on emerging from the Bolan Pass that we first became acquainted with this new scenery. For ourselves, while disappointed at finding a want of clothing to the country and some absence of picturesque beauty, we felt that here at all events our cavalry could act as our watch and guard. We found we had liberty to move and ability to see far and wide. To the horseman, these wide open sweeps of country were everything, to the footman they presented many a dreary mile of march.



FIG. 1.—PLAIN OF DASHT-I-BEDAULAT.

The section here given fairly represents that of the vale which lies between the mountain of Murdar and Chiltán as seen from the point looking towards Sir-i-ab, where the road commences to rise from the Dasht-i-Bedaulat, and takes to the skirt of Murdar. On this glacis the road lies for 15 miles all the way to Quetta. Such skirts, composed more or less of minute debris of the mountain slope, lie at slight angles of from 5° to 12° with the horizon. The composition and pose of these uniform masses do not favour the flow of water on the surface. The springs emanating from the mountain find a passage through the soil, and are only apparent a long way down, near the termination of the slope, or in the alluvium of the lower levels of the plain. Water however is to be found, and with a rare skill, the Afghan knows how

to nurse and lead the precious fluid in the *karez*, or underground channel, and apply it to fertilise those portions of the plain which are suited for cultivation, and which otherwise would remain sterile.

Another peculiarity which should be noticed before we proceed, is the abrupt character of the mountains and the opposition of their outlines to those of the plains. The lines do not run with grace one into the other. There is a weird severity of form. Ridges projecting boldly into the plains, like headlands on a sea coast, and the bareness of the plains, suggest the idea. This character is extended even to the occurrence of isolated portions of mountains, which look like islands in the sea.

Whence comes this abruptness of the mountain and strange uniform pose of the vast skirt at its base? How has this enormous mass of debris been spread out? Why do we not find remains of such formations elsewhere? Is their preservation here due to the slight rainfall? Such were the queries which occurred to us as we journeyed—points which we hope will be discussed by our more instructed fellow-students of physical geography.

We have to note here that the map furnished for our guidance at the commencement of our operations was that of Baluchistan, compiled in 1876, in the office of the Surveyor-General, Calcutta. There was also a map of Afghanistan, from the same source; both were very defective, showing that there was much to explore, and many errors to correct; both these maps were afterwards printed on cloth and distributed to the army. Major Wilson's more complete map reached us only when we arrived at Candahar. In the first stage of our proceedings we were not attended by officers of the Survey Department, and our staff was so limited in number, and so completely occupied by multifarious duties, that it was difficult to get any of our explorations properly recorded and put together. Every officer was thoroughly employed on the most pressing duties, and we were constantly on the move. Our first essays were, therefore, made under great disadvantages in this manner.

Colonel J. Browne, R.E., whom we found at Quetta, with an excellent knowledge of the localities, had prepared all the leading points of the Shalkot Ranges, such as Chiltán, Murdar, Musallugh, and Takatu, and with these plotted and taken into the field our officers found their positions by cross bearings with the prismatic compass, and the work of the several reconnaissances performed by Colonel Browne and Captains Hanna, Showers, and Harvey, and Lieutenant Smith, was compiled and plotted by Captain Hanna on our halting at the foot of the Khojak. This map of Pishin has considerable correctness as to the position of the villages and the extent and direction of the plains, but it gives but very imperfect impressions of the mountain ranges. It was printed at Lahore, and was returned for our use in January, and it formed then a

valuable guide in the operations preparatory to the return march through the Kakar country.*

As we came to understand the Pishin country more perfectly, we used to liken the whole basin, including the Shalkot Loras—all its streams are Loras—to some mollusc or sea-monster. The body might be represented by the wide plains from Haikalzai to Gulistan Karez in one direction, and from Alizai to the mouth of the Gazarband in another. The arms would be the two branches of the Shalkot Lora, the Kakar Lora, the Surkhab, with two streams feeding it, and the Barshor Lora. The feelers might be represented by the Karatu, Khojak, and Gulistan (Ghwaja) Nullas. Such are the many arms of the basin we have to describe.

Framework or Boundaries.—The framework of the plains of the basin of the Lora is grafted on to a spur of the Safaid-Koh, which is itself an offshoot of the Hindu Kush. This spur has been styled the Western Suliman, and traced as a continuous marked feature. We apprehend that as we come to know more of the features in the unexplored space to the south-east of Lake Abistada we shall find that our old maps must undergo considerable modifications. With regard to this northern portion of the range, we have ourselves no information, but with that part of it which is represented as culminating in Toba Peak we have some perfectly accurate details, which we think will be found to be remarkably interesting.†

Eastern Boundary.—During the reconnaissance which was made to prepare for the movement into Pishin, it was observed that the plains of Kujlak (Khushlak) extended, as a gradually rising vale, far away to the north-east, along the western flank of the Takatu Mountain and its continuations. There was no trace of such a formation in the maps, and we were informed that no European had ever visited those parts. As soon therefore as possession had been taken of the centre of the province, a reconnaissance, under the direction of the General, accompanied by Colonel Browne, was set in motion.

The point made for was Gwal, which, resting on the slope of the Jhur Range in an open vale, lies at the exit of the old caravan road through the Sagarband defile. The range of mountains lying to the east of the vale seemed continuous, and the cleft of the defile was hardly perceptible.

* The map accompanying this paper has been constructed from the above and the reconnaissance sheet executed by Captain Holdich, R.E. (which is a valuable and perfectly correct addition to the geography of this hitherto unexplored region), collated with Major Wilson's map of Afghanistan for the Shalkot district and the country about the upper waters of the Shorud Lora and the Bolan Pass. Captains Heaviside and Holdich, R.E., of the Survey Department, were attached to General Biddulph's column for survey operations on the march through Borai to the Derajat. Captain Heaviside was deputed to carry out the astronomical observations, and Captain Holdich the topography.—Ed.

† Major Wilson leaves out the range altogether.

It was the custom in the movement of our reconnoitring columns to give no clue as to the direction in which they might move, and to this we owe in great part an absence from molestation. Thus the exploration of the Sagarband defile was at once commenced while we were on the march to take up a position at Gwal. At about a mile from the opening, a ruined tower marks the importance which the point of entry and exit possessed in the olden time. The Kakar Lora issues from the cleft a bright, clear little stream, and for a mile or so we cross and recross it, and cut off the windings, and then emerge in a more open country. We here leave the running water which comes from the south from the direction of the Sura Khwulla Pass, and then follow up the bed of a dry affluent of the Kakar Lora, and at about the sixth mile, in a direct line, from Gwal, we reach a second portal, called Gurkhai. Amira, the Malik of Gwal, is in attendance to give us information as to the localities, and this he does very intelligently.



FIG. 2.—VALLEY LEADING N.E. TO MULAZIM SKOBAIN.

From the height to the south side of the Gurkhai gap we make out that we are in a country of a very broken character, of minor elevations, with the main range behind us, and Takatu end on and severed from it by the Kakar Lora; this bold promontory now appearing as an isolated and grand mass of a conical form.

Takatu we find to be joined on to Zarghun and Murdar by a low ridge (Fig. 3) in which occur two depressions, which are in order the Sura Khwulla and Hunna passes. Here, in the first pass, is the water-parting of the Shalkot water and that of the Kakar Lora we had lately followed. In the Hunna gap the waters flow on one side back to the Shalkot Lora, and on the other towards Sibi. We were approaching a country rich in water-partings. In front and to the north-east there was a sea of hummocks of a strange and confused configuration, presenting rounded surfaces of bare earth and clays of various colours. It was late, but we made out the valley stretching towards Borai, winding to the north-east, and returned to our camp at Gwal.



FIG. 3.—MT. TAKATU.



FIG. 4.—LOOKING DOWN THE VALE TOWARDS KULAK; SHOWING THE LENGTH OF THE PLAINS ALONG THE KAKAR BORDER.

From Gurkhai we resumed our interesting and necessary explorations the following day, and reached the Ushmughzai ridge after following up the nulla to its head, passing through the strange hummocky ground noticed the day before. The Ushmughzai is a low ridge running north-east and south-west, of easy outline and soil, and offering no great obstacle to a road. Here we reach the point where waters flow back to Pishin and on to Sibi, we are therefore on the crest of the spur which forms the eastern boundary of Pishin. Strange to say we have passed through the line of the greater elevations, and though we are in the presence of high points and ridges they are detached, and it is not easy to make out their disposition.

Direct to the eastward, across a plain called Brahiman, a beautiful mountain mass rises, which is cleft diagonally to its very base, and called 'Tsaroë Tungi (Fig. 7). The combined stream of drainage takes its way towards Sibi through the cleft, which also gives passage to a track said to be passable for camels. To the north-east we noticed a high ridge, which we afterwards made out to be Mazwah, and along its southern flank the valley passes, which we were informed gave a perfectly traversable road towards Smalan, Borai, Tal, and Chotiali, through Mulazim Skobaie (Fig. 2). We noted that the country skirting the Brahiman Plain trending to the north-east was open and easy to traverse, so we made a push to reach a more distant point of observation. A gallop of four miles brought us suddenly in full view of the village of Ahmedun, the headquarters of Malik Fyzu and of the Panizai Kakars (Fig. 5).

Having come upon the village unexpectedly to the inhabitants and to ourselves, we halted, and opened communications through the good offices of our guide Amira, who is a Kakar. After some difficulty and delay, the villagers were induced to come out and talk with us, and we were able to remove any hostile feelings, if such had existed. So far, we had met with no inhabitants, and the country had a look of extreme desolation. The village of Ahmedun, disposed on a low ridge above a little stream, to which we afterwards approached, had an air of comfort and relief. Orchards and plots of cultivation mixed with the houses, and the beetling cliffs which overhung the village, and the grand outline of hills of rich colour, composed a picturesque scene which we shall long remember. Our inquiries confirmed what Amira and others had described, and it was a great satisfaction to us to find that the veracity of our guides and instructors in Kakar geography could be depended on. It was sunset, and, well satisfied with our day's work, we withdrew peaceably, to make 18 miles of intricate road back to our camp, which we reached long after night had closed on us.

Subsequently, Colonel Browne revisited Ahmedun, and was attended by Captain Holdich, R.E., who thus had an opportunity of laying down with more accuracy the topography of which we were able only to make hasty notes.

Having thus made an important step towards the exploration of the old kafila route, and, as it were, opened the door of the Kakar country, we pursued our way along the border to the north-east, making for the villages of Khanizai (Kanozai) and Balozai.

The great features of the continuous range on our right, to the east of our track, and of constantly ascending open plain, were still prominent. The left of the vale we found was bounded by the Jhur Range, a feature of minor magnitude, and of soft outline. The eastern line of hills, north of Takatu, takes the names of Mulla and Barai, and there is a peak called Surana. A little to the north of Zarghun Karez, we insensibly reached the water-parting between branches of the Kakar Lora and the Surkhab, but at this season there was no running water in the bed of the stream, though the village lands find sufficient for irrigation from karezes. Soon after passing Zarghun Karez, the Jhur Range sinks into the plain, and at its termination we find the village of Khanizai situated in the midst of a wide plain. The plain is surrounded on three sides by high ranges of hills, and, stretching for many miles to the north-east, terminates under a fine mountain, which we afterwards ascertained to be the Kand Peak. Under the peak, and to the south of it, there is a low and open pass, and this, we are informed, leads direct into Zhob.

Due east of Khanizai there is an opening in the range, and at some distance within the outlying ridges a commanding peak rises, which is described to us as Surghwand. This opening in the hills, we are told, leads direct to Borai, Tal, and Chotiali.

We observe that from the Kand Peak a spur springs, which running direct towards Pishin, there terminates in a peak which is named Shorgandai, the spur itself being called the Timurk Range. The Balozai-Khanizai Plain, which forms the basin of the Surkhab, extends to the south-west, following the course of this stream between the Jhur and Shorgandai hills, and it thus forms a continuation of a fair highway of plains in a great loop running along the whole Kakar border of the province of Pishin.

These features, hastily observed, we were able to understand imperfectly, but the expedition on which we were engaged could not be prolonged to enable us to pursue our investigations and complete our topography. We wished much at that time to look into Zhob and Borai, and actually visit the water-parting from the great spur of the Safaid-Koh, to the Indus on the one hand, and to the Sistan Desert on the other. We halted at Khanizai one night, and on the following day the column was directed over the Surai Mugzaie Pass towards Kila Khushdil Khan. Before we left, Colonel Browne, having lost sight of Chiltán, calculated a base between two hills by timing the report of guns, and thus gave a new support to our topography.

It was not at that time likely that either Colonel Browne or any of

us would revisit these parts, and we left the work of discovery incomplete, with much regret.

An idea of the scenery and physical character of the country so far under description may be obtained from the accompanying Sketches, Figs. 4 and 5. Sketch No. 4 exhibits the length of plain along the Kakar border, looking back towards Kujlak—the reverse of that view which attracted our notice at the commencement of the expedition. The superiority of Mount Takatu is here very prominently shown, and it rightly asserts itself; for in every position it forms a striking and beautiful object in the Pishin landscape. In Sketch 5 we view the opening in the range towards Borai, and become acquainted with Surghwand, a peak which will in future enter into our geographical descriptions. The village of Khanizai stands in a well-watered portion of the great plain, which produces all the ordinary grains in fair abundance—more than sufficient, as we fortunately found, for the inhabitants and for our troops.

It is not, however, our purpose to enter into minute descriptions of inhabitants or of produce, but to consider specially the physical aspect and the framework of the country. To enable us, therefore, to complete the eastern border, we shall now leave the track of the reconnoitring expedition so far followed, and pass on to a time four months later, and note the discoveries made on the return march of the columns towards India.

For this operation, under sanction of Government, the arrangements with the tribes for the supply of the troops were made by Major, now Sir Robert, Sandiman, K.C.S.I., and our columns were halted for organisation at Balozai in the admirable position afforded by the great plain there. We ourselves reached that place on the evening of the 22nd March, after a somewhat forced march from the Helmund.

Simultaneously with the entry into Kakar country, it was considered advisable, as a military measure of precaution, to reconnoitre to the right as far as Ahmedun, and to the left as far as the Zhob border.

The expedition to Ahmedun was entrusted to the direction of Colonel Browne, and we accompanied the reconnaissance towards Zhob. This reconnaissance, which was made on the 23rd March, was supported by eighty rifles of the 1st Goorkhas and eighty sabres of the 15th Hussars, under command of Captain Langtree. The expedition was accompanied by Captain Heaviside, R.E., who superintended the running a traverse by a native surveyor. Captain Wylie attended as political officer, and a native of Balozai acted as guide.

We found the plain through which the western branch of the Surkhab flowed extending to the north-east, perfectly open, for seven miles, with a gradual ascent; the vale then narrowed, being enclosed between low hills. For two miles the track led up the bed of the stream, which found its way through a defile of low cliffs and rounded hills of soft strata. At about the ninth mile we emerged upon a wide plateau, saucer-shaped as

regards its cross-section, and extending longitudinally with a gradual rise as far as the eye could reach. We here find ourselves abreast of the village of Tlarai, which, nestled in fruit-trees, lies on the slopes of a limb of the Kand Mountain, which rises to the left of the pass. We are some distance yet from the water-parting which we wish to reach. As it was late at starting, and the distance considerable, we left the infantry on the plateau at the tenth mile, while we pushed on with the cavalry for further exploration. During this time the native surveyor was running his traverse with the plane table.

We rode for six miles over the very open, gradually rising plain (Fig. 6), and reached the village of Mehtarzai. The inhabitants of the village, never before visited by any Europeans, turned out peaceably to communicate with us, and we had a long conversation. We were informed that they and all the people of the plateau were independent, not having ever been under the rule of the Amirs of Kabul, and that they hold only a slight allegiance to Shah Jehan, the Zhob chief, though they belong to the family of the Kakars.

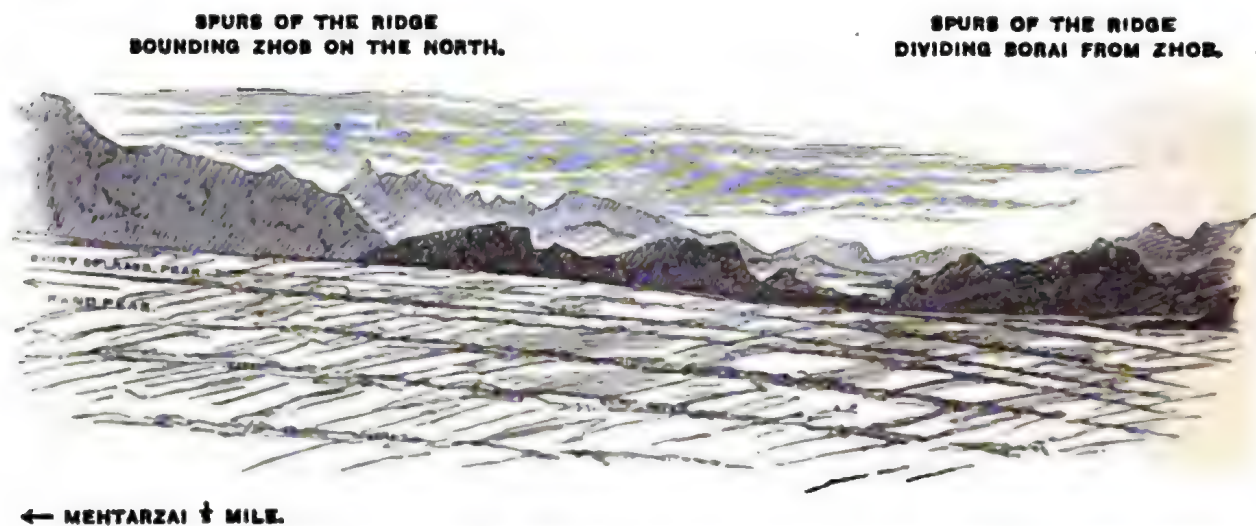


FIG. 6.—VIEW LOOKING E. BY N. DOWN THE ZHOB VALLEY FROM THE WATER-PARTING OF PISHIN AND ZHOB.

From our point of view on the skirt of the Kand Peak itself (Fig. 6) we saw the spurs which, springing from the great parent spur, terminate on the Zhob Valley and form a long perspective, bounding it on the north. We observed on the right the commencement of the spurs which project from the ridge, which we afterwards made out divided Borai from Zhob. The fairway down the valley and the first plains were visible, the direction of the valley lying 15° north of east.

The water-parting was somewhere abreast of the village in the centre of the saucer-shaped plateau, which, by a uniform and easy slope, such as that by which we had gained the summit, descended towards Zhob. Our calculations gave the elevation of Balozai to be 6392 feet above the sea, and that of the Mehtarzai Kotal to be 7139, the rise was therefore about 750 feet in a distance of 15 miles. The natives call the water-parting Sarah Buzzah, and the whole plateau is named Kahan; in width it is about five to six miles, and the length may be 12 miles.

The whole area, which is of a light soil, is more or less under cultivation. The few villages we saw were surrounded by orchards, but there is a lack of trees elsewhere, though there is a sparse growth of grasses and shrubs.

Kand Peak was ascertained by our survey officers to be in latitude $30^{\circ} 48'$, and longitude $67^{\circ} 29'$, therefore, 55 miles south-west of its position on the old maps; the spur of the Safaid-Koh (by whatever name we may eventually call it) consequently has a more westerly direction than has hitherto been represented, and forms the eastern boundary of Pishin. Kand Peak we had seen snow-clad, and forming a commanding point as we marched along the Daman road, coming from Candahar. As we opened the Barshor Valley it came well into view, and asserted itself as one of the chief objects in the ranges which form the boundaries of the Pishin plains.

The physical character of this pass, its comparatively low elevation, the easy gradients leading to it, and the cultivated, open nature of the habitable plateau, mark it as a way of communication between two great systems of populous plains, which must in the future come into use, and we are sure to hear of it again. This exploration defined the extent of the Pishin basin in this direction.

These reconnaissances completed, and all being in order, the second column, under command of Colonel R. Sale Hill, 1st Goorkhas, was on the 24th March put in movement, and the General and staff marched with this body. The first column, under command of Major F. S. Keene, 1st Punjab Native Infantry, and under the guidance of Major Sandiman, was already several days in advance in the Borai Valley. The third column, under command of Brigadier-General J. Nuthall, was to follow the second column on the 25th.

The route selected by Major Sandiman was up the eastern branch of the Surkhab through the opening, represented in Diagram 5, which leads direct on the Surghwand Peak. The track lay across the plain, gradually rising up the mountain skirt, and entering the low hills by an open passage. To cut off a detour, made by the river to the north of the direct line, we pass over the Mosai Kotal at an elevation of 7078, and then gain the bed of the Togai stream, which we find to be 6954 feet above sea-level. The Surkhab here assumes the name of Togai. There appears to be no physical difficulty in following the valley. The road now winds up the valley, crossing and recrossing the stream. We pass hamlets of the Yusuf-Kach (Isaf Kach) settlement, cultivated plateaux, and note fruit and willow groves, with houses roofed with timber and grass. We encamp in an amphitheatre on a sloping field, which is pretty well covered with grass; and altogether there is a more abundant vegetation, gratifying to our eyes.

An ascent of some 400 or 500 feet to the height on the south of our camp reveals to us the configuration of the country. The point ascended is called Zuddin. The country spread out at our feet is desolate

and weird. A rough plain extends easterly and south-westerly, fitted into the base of the line of hills which forms the southern boundary of the Togai Valley. To the south-west we recognise many points. Ahmedun is not visible, but we make out where it lies, and the lumpy plain we look over extends to the hummocky country about Ushmughzai. Takatu, a fine, conical object, marks where lie Quetta and Kujlak. The eastern affluent of this branch of the Togai finds its source in an upland called Pinakai, which is at the north base of Mazwah.

To the south-east we see fully developed a mountain mass, which, with Surghwand, we had observed from afar as we were marching eastwards. It is now revealed to us to the base, extending as a precipitous ridge twenty to twenty-five miles long. Mazwah is the name given to it by Kullu, a very intelligent guide who joined Colonel Browne here. An affluent of the Togai rises in the plain before us, coming from the south-west and from the east in two or three branches, and the combined stream finds its way through a gap in the hills a little to the eastward of our camp. To the north the hills rise to considerable heights, the crest of these being retired from the Togai Valley. The northern slopes of this range descend towards the Mehtarzai Kotal, and the drainage of the south reaches the Togai stream.

The elevation of the Yusuf-Kach camp we found to be 7180 feet, and the distance from Balozai being nine and a quarter miles, we have a rise so far of 788 feet, and the gradient following the river would be less severe.

The course of the march on the following day was up the Togai Valley, which, hemmed in by a line of hills on either hand, had a direction at first east and then E.S.E. We passed several pretty hamlets, plots of cultivation, and groves of willows. We noticed one rather considerable stream, which joined the Togai from the ridge to the north. The valley rises gradually, there are no difficulties to be encountered in the construction of a road for wheeled traffic, and Colonel Browne considered that the turns were not too sharp for a railway.

So far we have had Surghwand as a fine mass in our front, but now on turning its shoulder we see it in flank, and it loses in beauty of form. Gradually we enter on a highland country of confused low hills, composed of highly-coloured earths and clay. The growth of grasses and underwood increases, and cypresses of great age and of grotesque forms are grouped and dotted over the landscape. Mazwah rises on our right front, and becomes a most imposing and picturesque object.

At the 11th mile from Yusuf-Kach, the head of the Togai is gained, and the height is found to be 8277 feet, making a rise in the 11 miles of 1097 feet. Here is the water-parting of Pishin and Sibi waters. The pass is called Ushtirrah Sirra; it is situated to the south-west of the peak of Surghwand, and is about four miles distant from it. The country around for many miles is quite uninhabited, and there appears to be an absence of water in the neighbourhood of the kotal.

We were unable to make the ascent of Surghwand, or ascertain its physical character; and this was the more to be regretted as it proves to be in some respects the most interesting of the summits of the great range which we were studying. From its crest we should have seen into Zhob, into Borai, and also into Pishin. From its slopes waters flow in four directions—towards Dera Ismail Khan, towards the Kuchi Plain, viâ Borai and viâ Sibi, and back to the Sistan Desert, viâ Pishin.

We have now, in following the Kakar Lora and the Surkhab to their several sources, ascertained and defined the limits of the Lora, or Pishin, basin, on this eastern side of the province, and become acquainted with three passes and roads leading towards India. We have found most prominent as landmarks, and also as grand mountain forms, the Peaks of Kand and Surghwand, and the precipitous ridge of Mazwah, and the isolated promontory of Takatu. Toba Peak and Mount Chappar, prominently given in the old maps, we have not heard of. The line of water-parting is thus through Kand, across the Mehtarzai Kotal, up Surghwand, down to Ushtirrah Sirra, across the Pinakai upland, then skirting Mazwah, through the lumpy plain to Ushmughzai, and on to the Surra Khwulla and Hunna passes, where it reaches Murdar, a well-known point.

Northern and Western Boundaries.—Having thus disposed of the eastern side, so far as we are able, we will turn to the northern and western limits of the basin.

We know now that the Timurk-Shorgundai promontory is rooted into the Kand Peak. The western faces of this ridge drain into the Barshor Lora—the ridge itself forms the eastern boundary of a great bay of the plain which runs north-east of Khushdil Khan, up the valley of the Barshor Lora. We have penetrated some little distance within the low hills in the direction of Barshor, and gained a high point on the western side of the valley. We found the Lora making its passage through the hills; a bright clear stream, with a considerable amount of water, and a bed which told us that the drainage area must be very extensive. We were unable to see the open valley which was said to lie within the hills. Up to the time when we left Pishin no one had explored the upper portion of the Barshor River; but it is probable that this interesting part of the province has since been examined. Up this valley a road to Ghazni leads, and it was used by our troops in the old wars.

Continuing our course westerly, we find that the range forming the western boundary of the Barshor Plain terminates in a promontory at the villages of Brahamzai and Zeri. Still more to the westward, opposite the large village of Alizai, an opening of the range occurs, but of a different character from the valleys of the Loras and Surkhab. Here the skirt of the mountains rises rapidly, and leads to the Karatu Pass by a

steep gradient. These parts were explored by Colonel H. Moore. Taking a departure from the village of Zumri, Colonel Moore, at about 15 miles distance from that place, came upon the edge of the Toba Plateau. A road to Ghazni could be traced over a plain which stretched for miles, bounded by low hills to the north, and a track led to the Kadanai plains, and on to Candahar. These extensive plateaux fill up the whole mass of the angle from here to the Khoja Amran. They are the summer camping grounds of the Kakars and Achakzais, and we thought the elevation of 7500 feet would afford a suitable sanitarium for our troops.

We are much in the dark as to that part of this whole mountain range where it springs from the parent spur. We surmise, however, that it will be found to be rooted into it some 50 miles to the north of the Kand Peak.

Coasting along the skirt of the range we find it broken only by lesser watercourses, up which lead tracks to the Toba Plateau. The glacis formation is here seen in a very remarkable manner—tilted plains extend from the mountains till they merge in the level plain of the Pishin Valley itself, the whole way from Alizai to Arambi-Karez. Along this formation, unimpeded by deep nullas or river courses the Daman road to the Khojak runs. At Arambi-Karez the mountains project into the plains as a promontory, and then occurs the recess and amphitheatre of Kila Abdullah Khan, which is situated at the south side of the recess.

Into this basin short valleys, springing from the Toba Plateau and the crest of the Khoja Amran, converge, and the easy slopes and valleys give a pleasant locality for the Achakzais, who have always here lived a wild, semi-independent life, owning scarcely any submission to the amirs. In the cold weather many of the tribe migrate to the desert and in the hot weather the Toba Plateau affords a cool retreat.

During our march on Candahar the Achakzais committed a massacre of a few detached men, and attacked one of our convoy escort camps. A column was marched to punish the offenders, but they absconded to the mountains. During this expedition Arambi, the chief village of the clan, was visited, for the first time, by our troops. The locality is described as a flourishing valley with a good deal of cultivation and fruit-trees.

So much has already been written on the subject of the Khojak and the Khoja Amran generally, that a minute description will not be necessary. We may not, however, leave unnoticed passes which are now routes easily traversed for even wheeled traffic. The Khojak Nulla is a dry river bed; wide and ascending easily, it offered a track for a road which required no making. At about the ninth mile from Kila Abdullah Khan the spurs press on the nulla and it becomes a defile. The defile at about a mile from the top is still wide enough to afford camping ground, and there is a good deal of khinjak wood in the valley and of brushwood on the slopes of the hills. Gradually the nulla is

completely compressed between rocky sides and the gradient increases, and for half a mile from the top it is very steep.

In three days our troops improved, sufficiently for camel and mule traffic, the native tracks, and in one part we brought into use a portion of the road made during the old expeditions. The summit is more or less rounded, and we were enabled to cut out of the hill-side platforms for siding guns and carriages. The descent is far more abrupt than the ascent, and at first the passage of laden camels caused these poor creatures much suffering, and the loads were cast, and blocks of the transit took place. In a short space of time it was impossible to make roads with good gradients, so to pass over guns a slide was made, having an average slope of 30° , which led from the top down to the commencement of an easy slope which extended down to Chaman. In a day and a half a whole battery was passed over, and a steady stream of troops, camels, cavalry, guns, moving onward, and of unladen camels returning, produced a busy scene of traffic from early morning till dark.

The operations of road-making were executed by the troops and a few Ghilzai labourers, under the skilled direction of Colonel W. Hichens, R.E., and his engineer officers. The passage of the Khojak occasioned much arduous work, which was executed by all concerned with an admirable spirit.

We were not willing, however, to allow the opportunity to slip of perfecting the communication. A line of road was at once traced out suited for wheeled traffic. The direction of this work was left to Lieutenant H. S. Wells, who executed it in six weeks with a gang of Ghilzai labourers. The length of the road is one mile 880 yards, its width 13 feet, and the average gradient about 1 in 14. The soil is so well suited for its maintenance, and there is so little drainage area above the road, that it is almost indestructible. We make the height of our camp on the east side of the Khojak 6742 feet, and that of the kotal 7380.

From the Khojak Peak, 8017 feet, and from the ridge generally, there is one of the most surprising views we have ever seen. The plains of Kadanai, leading on to other plains, are laid out like a map, and, seen in the marvellous clearness of the frosty air of December, the effect was most extraordinary. Beyond the plain, ranges of strangely isolated masses of hills run in parallel lines north-east and south-west, and jut out towards the desert which lay to the south like a sandy shore. There were rocky hills far away in the midst of the desert, appearing like veritable islands, and islets occurred in the Kadanai Plain. There was no wood and no verdure on the plains, and at that elevation and distance it was not possible with the naked eye to make out any villages, and we could hardly do so even with the glass. The aspect of this sterile-looking country did not foreshadow to us the sufficiency of food afterwards supplied at some of our camps on the way to Candahar.

The Khoja Amran, a uniform and featureless range, forms a regular rampart between Pishin and the country beyond, which is some 2000 feet lower than the Plain of Pishin. The pass next in order through this barrier is the Roghani, a track only fitted for foot and horse traffic. Opposite Gulistan Karez there occurs the nulla up which lies the great kafila road to Candahar. The pass debouches on to the plain on the west side at Gwaja, which gives its name to this route.

Our officers having pronounced that the Gwaja was by nature a much easier gradient than the Khojak, and therefore suited for the passage of the heavy artillery, Lieut.-General, now Sir Donald, Stewart decided on preparing it for that arm, and for the march of the division led by himself in person. Colonel R. H. Sankey, R.E., was therefore directed to superintend the works, which were executed by our officers and troops. The native track was widened and improved, and by the devotion and energy of the troops the pass was ready for use in a very short space of time. The Spinatija Kotal is much lower than the Khojak, it is approached by a long, gradual ascent up a nulla. The descent on the west side is steeper than the ascent.

The elevations and distances show the nature of the gradients:—

Gulistan Karez	5112 feet
Ispintaza or Spinatija Kotal 12·2 miles	6888 „

giving a rise of 148 feet per mile.

The distance from the Kotal of Ispintaza to Gwaja, where the more level skirt is reached, is 10 miles, and the elevation of that place is 4591 feet, which gives a fall of 228 per mile, or of 1 in 23; it is probable, however, an easier descent may be found. After the Gwaja, the Khoja Amran offers no break to the south-west until it comes to an end.

As we were traversing the great plains of Pishin, from Haikalzai to Abdullah Khan, and from the Gazarband to Gulistan Karez, having the profile of the range in full view, we used often to wonder how the great plains extended to the south, and how the Khoja Amran finished. We often longed to explore this region, but having secured two good practicable routes over the range which answered our purpose, it did not fall within the limits of our programme to extend our explorations so far to the left. Subsequently, under the orders of Lieut.-General Stewart, expeditions were organised to report on the country in the direction indicated, and we are indebted to Major W. M. Campbell, R.E., to Captain P. J. Maitland, 3rd Sind Horse, to Captain Wylie, and to Dr. O. T. Duke, for information of much importance on this most interesting quarter of the basin of the Loras.

There is in every mountain system a characteristic configuration which only becomes apparent as we complete our study of it, and plot the work of survey. It is of the greatest benefit if we can speedily grasp the character, as it is often the key to the whole nature of the



FIG. 7.—TSABOË TUNGL.

↑
TO SIBI



FIG. 8.—THE PLAINS OF PISHIN LOOKING TOWARDS S.W. SHORAWAK IN THE FAR DISTANCE. SARLAT RANGE 50 MILES OFF.

country. The marked feature in the physical character of South Afghanistan, is the uniform direction and parallelism of the ridges. The great ranges in which lie the water-partings often have a direction of their own, at an angle to the parallel ridges. We find the usual direction of the ridges is from north-east to south-west, and this is the general lie of the slope or tilt of the country.

The range we call the Khoja Amran has this character of parallel ridges, and the feature is exhibited in the outlying range which extends from Kila Abdullah Khan to Gulistan Karez, which leaves an open, nearly level plain between it and the main range. We shall see that the Khoja Amran, though it terminates, yet has the feature of a continued range, taken up by a parallel ridge running in a like direction to the south-west for a distance as yet unknown.

Immediately south-west of the Spinatija Kotal the Khoja Amran is continued under the names, first of Ashusta or Shista, and then Tang. Long spurs branch off to the southwards, terminating on the desert and on the cultivated plain of Shorawak. There are isolated hills carrying on the feature into the desert itself, and the desert sand is dovetailed into the hills. There is here exhibited an actual movement of the sand of the desert over the true land, which it swallows up under the action of the prevailing west wind.

Poti, 31 miles to the south-westward of Ispintaza, is at the end of the Khoja Amran, and on the edge of the Shorawak cultivated land, which is estimated to have a breadth of six miles, and a length of 13 miles down to Hisabat. Including the skirts on both sides, the breadth of the Shorawak Plain is 10 miles, and its length may be 50 miles. The Lora River enters the Shorawak Plain at Mir Allum Khan at its north-east corner, and flows down its eastern border. The river, however, has its waters drawn off by numerous irrigation channels, till in the dry season no water remains. In flood-time the water is stored in reservoirs. The water of the Lora being highly charged with a fertilising mud, the result of this deposit is that Shorawak is very fruitful, bearing all the common grains, &c., abundantly. The plain is 3250 feet above the sea and the climate is perfect in winter, though very hot in summer. Camels thrive well, and the tamarisk and other plants afford abundant grazing. The chief possessors of the Shorawak Plain are the tribe of Barechi Pathans. The Brahuis are mixed with them on the south border, and the Achakzais hold the north border.

The boundaries of this country are: on the western side the desert, on the north the spurs of the Khoja Amran, and on the east the Sarlatti, or Sarlat Range. The south border is not so clearly defined.

The nomenclature of the mountains in these countries is exceedingly difficult to decide. No two tribes agree in pronunciation or in the names by which they describe the same feature. Observers at the

same time find it very difficult to catch the correct pronunciation, and, receiving their information from a variety of sources, no two travellers are found to agree. There is therefore much difficulty surrounding this branch of the geographer's duty. As a rule, we are apt to give a general name to a range of mountains, because we notice that it is a great physical feature; but the untravelled and unlearned natives have their own name for the particular portion of it known to each. One can only suggest that the greatest care should be taken in catching the pronunciation, in being sure that we have the right name, and in having it entered in plan and report in a perfectly legible manner.

The Sarlat Range commences a little to the south of Gulistan Karez, as a ridge parallel to the Khoja Amran, and divided from it by the Tangi gorge and by the Lora defile, also called Tangi. This ridge thus overlaps the Khoja Amran. At the north end this range receives the name of Walli or Salwatu, to the south it is called Salat, Salotu, Sarlat, and Sarlatti, and Dr. Duke adds the name of Singhbar. We prefer to use the name Sarlat, by which Major Campbell familiarly calls this feature. The western faces of the Sarlat drain towards Shorawak to the Lora, which in flood-time pursues its course between the desert on the west and this range on the east. The Lora basin is therefore here compressed to a breadth not exceeding 20 miles—a strange contrast to the wide diameter it has across the main plains of Pishin about Haikalzai. The eastern slopes of the Sarlat drain towards a valley called Ispinkai, which is about 2400 feet higher than the Shorawak Plain.

The north end of the Shorawak Plain is a meeting-place of routes. The great kafila road from Kelat to Candahar crosses the Lora at Mir Allum's Fort, and, proceeding by Poti, it turns the Khoja Amran, and gains the Gwaja and Candahar route. The only difficulty met with north of Shorawak is the short defile through the Chawéli Range, which is an east and west semi-detached spur of the Tang; the defile is 2½ miles in length, it is not steep, but would require some labour to make it practicable for wheels.

It would be well if we could find a passable route into the Shorawak Plain from the north-east or eastward, but this does not appear to be possible. The road to Pishin up the Tangi gorges is very difficult, it has to cross and recross the Lora, which, in flood-time, would render the passage impassable.

Over the Sarlat Hills, to the eastward, there are three passes—the Shutar, the Salwatu, and the Bed Kotals; of these, the last is described as the best. It enters the hills about opposite to Hisabat, which is 13 miles south of Poti. For eight miles there is a gradually increasing gradient up to 1 in 23 to the foot of a final ascent, which is even steeper, and narrow. From the crest the descent leads to the fairly open valley of Ispinkai to a place called Iltaz Karez, 3½ miles distant from the crest.

There are a few huts here, and a stream and a tank, but no supplies. This road is therefore one which would offer considerable difficulties to the railway. It is not our intention to devote too much space to the consideration of the roads, but the question does arise here as to whether this route does satisfactorily turn the Khoja Amran. The country to the eastward, in the direction of Quetta, is crossed by a number of ridges, and cannot therefore be compared with the plains of Pishin in regard to the facilities offered for a railway; we are therefore led to the conclusion, that we shall not find any route which affords such facilities as the Gwaja, where the difficulties, we believe, may be overcome.

Southern Boundary.—In carrying out our purpose of defining the next portion of the frame or lip of the Lora basin, we now find considerable difficulty, as we have no plan, and only a sketch report of Major Campbell's to study.

As before mentioned, the Ispinkai Valley is, proceeding eastwards, the next valley to Shorawak. There is a branch of the Ispinkai Valley, which, equally with it, seems to take its origin to the north, in an offshoot of the Sarlat Range. This valley is called Kotori, it drains into the Ispinkai Valley, which runs parallel to the Sarlat Hills, and the waters of this last run southward, and fall into the Kaiser, which flows towards Nushki. We are unable to trace this connection, but from the direction of the head of the Ispinkai and Kotori valleys, we know that from where these spring there must be a water-parting towards Pishin, which defines the edge of the Lora basin in this direction. Following Campbell's track, we find that the feature next in order to the eastward of Kotori is an extensive vale running several miles to the north and also to the south-west, divided from the Kotori by a low water-parting. It seems to be bounded by hills in both directions. The width of the plain is three miles, it is gently undulating, with a good deal of level ground, and the elevation is about 5400 feet. The western edge of this plain appears to be about 20 miles from the Shorawak Plain, and the spot where it was entered is due east of Iltaz Karez, probably south-east of Poti. A short distance south of the track by which Campbell crossed, there is a water-parting, and from here water drains north into the Lora through the Kurum Dasht, and south to the Kaiser torrent by the Tilera Dasht. So that here we have again the edge of the Lora basin. All these valleys, Ispinkai, Kotori, Kurum, and Tilera are without settled inhabitants—the country is a grazing ground for the pastoral tribes. To the eastward of Kurum and Tilera a continuous range, called variously Zarisar or Aliser, divides these plains from Shorud.

Shorud is a plain at an elevation of about 4800 feet. It is well watered by karezes which have their sources in the Zarisar Hills. There are five principal villages, Makhmad Kheli, Chichezai, Panjpai, Sir Kozai, and Mial Khanzai. Chichezai, seven miles E.N.E. of the

east end of the pass through the Zarisar Hills, is $18\frac{1}{2}$ miles from Itaz Karez. This valley, which seems to have its position now determined for the first time, will, when it has been completely surveyed and plotted, add much to our geographical knowledge, and having a drainage from south to north it belongs to the basin of the Loras.

Shorud receives the waters of the river marked in Wilson's map "Khurd Singbur." The Sir-in-ab, which is the combined river of Kelat, Mangurchur, and Mustang, also flows through a portion of the valley, and the combined drainage of this extensive basin then flows, under the name of Lora, northwards to Pishin, to join the Greater Lora there. This Lora is a salt stream, and it gives the name of Shor to the country it traverses—Shor-rud—we may therefore very properly name this Lora the Shorud Lora.

The boundaries of Shorud given by Campbell are: on the west the Zarisar Hills having a direction N.N.E. and on the east the Dinar Range a defined feature trending north by east. This direction will set the course of the Shorud Lora very far to the north-eastward of that indicated in Wilson's map, which shows it sketched with a north-west course from Panjpai until it falls into the Pishin Lora. The direction given to the ranges bounding Shorud renders such a course impossible. We believe that the confluence will be found to lie about due west of the Gazarband, and not far south of Segai, which is on the Lora, between the Gazarband and Gulistan Karez.

In the present state of our geographical knowledge of all this quarter it is impossible to make a satisfactory study of the water-partings of the Shorud Lora basin. The western lip is as yet very undefined. The area drained by this river is very extensive, and it would be very interesting to have a separate report on it. The Kelat branch appears by Wilson's map to rise in the Herbui Mountains, an offshoot of the great Hala Range. Thus from south to north, from the source of the Kelat stream to that of the Surkhab, the basin of the Loras is 160 miles across. In the highlands of the Hala Range are the sources of streams running in every direction.

While we are studying this portion of the Lora basin, it will be well to record what is known of the road which strikes south from Kelat to gain the sea at Sonmiani.

The distance from Kelat to Sonmiani is 340 miles, which is divided into twenty marches. Some of these marches vary from 18 to 24 miles, the stages being of this great length on account of the scarcity of water. There are only six places—viz. Sohrab, Bagwaná, Khozdar, Wudd, Bela, and Uthal—where supplies in any quantity are procurable, and at most camps little or nothing is to be had. The heat on the southern half of the road is naturally very great, rendering this route impassable during four months of the year.

The harbour at Sonmiani is unfit for vessels drawing over 17 feet of

water; and this difficulty, added to the general impracticability of the road, throws this route out of consideration in discussing the possible roads to Pishin.

South-eastern Boundary.—We must now turn to the remaining portion of the basin under study with which we have a personal acquaintance.

The Great Chiltán, 12,000 feet, rises from a girdle of plains, which, though elevated, and forming part of a high table-land, still leave much grandeur to the abrupt forms of this commanding ridge, which was so far our leading landmark. The skirts of Chiltán give rise to waters flowing to the Dasht-i-Bedaulat, towards the Shorud Lora, viâ the fertile little valley of Kanak, and towards Mustang. From a little to the west of Chiltán flows the left branch of the Shalkot Lora. The right or Shull branch rises in the eastern skirt of Chiltán at Sir-i-ab. Other sources of this Lora lie in the Hunna and the Surra Khwulla passes. Chiltán, Murdar, Takatu and the range called in succession Dinar, Musallugh, and Anjeram, form the boundaries of the Shalkot valleys.

Having thus defined the lip of the whole basin as nearly as we are able, we proceed now to give our impressions of the interior space—the plains and intersecting ridges.

Plains and Intersecting Ridges.—The Shalkot valleys and plains are continuous, without the break of any dividing ridge. From Sir-i-ab to the base of the precipices of Takatu, there is one unbroken vale of plains and skirts, five to six miles wide and 15 miles long. From the Hunna Pass to the slopes of the Musallugh, for a distance of 16 miles, there is one sweep of open valley. The valley to the west of the Chiltán ridge is no less open, and it meets the Quetta Valley, and continues and joins the Kujlak and Urumzai plains. Wilson's map gives this feature fairly well; but the map of the Suliman Mountains, in the Society's 'Proceedings,' brings the slopes of Chiltán and Takatu until they meet on the banks of the Lora. We would here venture to observe that the small scale on which such maps are drawn, does not permit the draughtsman to give any shading to such small features as the gentle slopes of the mountain glacis, or to the minor ridges and spurs. If such minor features can be represented, they should be traced with the lightest and most delicate indications.

The Shalkot plains, as we have just said, are continuous, and run round the spur of Takatu, over which the Murgi Pass offers a short cut to Kujlak, the open vale of the Kakar Lora being produced right up to the Balozai Plateau, as described in the early pages of this paper. This distinct feature of plains of the Shalkot and Kakar Loras is divided from Pishin by ranges of minor character, and broken and confused hills.

From Anjeram, in continuation of the range, a long spur is thrust out to the north-east, which, though broken and gradually sinking into the plain, can be traced all the way to Khushdil Khan. This range is crossed by the Gazarband, in a direct line from Quetta to

Gulistan Karez. And here the range for some distance divides the Shalkot and Kakar Lora Plain from the great Plain of Pishin.

From abreast of Nilai, a little to the north of Kujlak, there commences the defined uniform feature of the Jhur Range. Though of minor elevation, it has a distinct character, dividing as it does the Kakar Lora Valley from that of the Surkhab, and the plain of Syud Yaru Karez. The southern termination of the Jhur, and the northern extremity of the Anjeram, throw off many wave-like lesser ridges and hummocky hills, which complete the separation of the Kujlak Plain from that of Syud Yaru Karez.

This configuration has a great importance, as it divides the basin into compartments. The boundary between Kelat and Afghanistan runs diagonally from a little north of Kujlak, leaving that place in Kelat, and Julobghir and Mehtarzai in Afghan dominion.

The Kakar and Shalkot Loras approach each other near Julobghir and Mehtarzai, and there is between them a level tract down nearly to their junction; the left bank of the Shalkot stream, however, has cut into the projections of Anjeram, and the Kakar Lora has on its right bank scarped those of the Jhur. The road to Pishin crosses the Shalkot Lora near Kujlak, where the banks, 20 to 25 feet high, are composed of clay. The road then crosses through low hills, finding some level ground and undulations mixed, and passes both streams a little to the eastward of the junction. After crossing the Kakar Lora, the edge of the open plain of Syud Yaru is reached at the village of Haidarzai.

The Syud Yaru Plain is wider than the plains just described, and extends to and joins up with the Surkhab Valley, and is unbroken in the direction of Khushdil Khan. To the westward, the long, broken projection of Anjeram divides it from Pishin proper. Having reached this dividing ridge, we find the whole plain spread out in one vast surface, extending to a distant horizon in the direction of Shorawak, where the Khoja Amran may be seen fading away into the horizon, and the Sarlat can be recognised floating like an island in the mirage.

We were first made completely acquainted with the whole arrangement of the internal part of the Pishin basin on gaining the top of the Surai Mungzai Pass, and in our excursion in the Barshor Valley.

This great open space is inhabited by a population of Syuds and Tarins, with a fringe of Kakars and Achakzais. Generally employed in agriculture and engaged in mercantile pursuits, they are decidedly peaceable in their habits, and would gladly be defended from the incursions of their more warlike neighbours who live in the hills which bound the north, east, and west sides of the province. Though the country is strangely bare of vegetation, it is abundantly well watered by the numerous streams and karezes which descend from the surrounding mountains. Chains of villages follow the watercourses, and the area of cultivation is even now very considerable. This interesting

country requires repose and the fostering care of a strong and good government.

Considering the miraculous change brought about by the last twenty years of peace and quiet in the Punjab and in Sind, it is possible to realise what will take place here. Before the next twenty years will have come to a close, the railway will have passed on towards Persia, through tracts of country over which it is even now possible to drive a phaeton. Roads or railways will have been constructed down the easy and fertile valleys of the Kakar country to India. The area of cultivation will have increased, and groves will have sprung up around the villages and along the watercourses. The people, already traders, will have benefited by the new communications, and in carrying their produce down to India and to the sea, and returning with European goods, they will have learnt by their intercourse the value of commerce and of a peaceable, firm, and just rule. Such has been the change produced in many other countries, and notably in those mentioned, which have passed under our influence in India, and we may safely draw such a picture of the immediate future of Pishin.

It is the duty of the explorer to obtain the records of the physical character of the countries he visits, and to convey the impressions he forms to the world, and in doing this his hope is that civilisation and benefit to man may follow in his track.

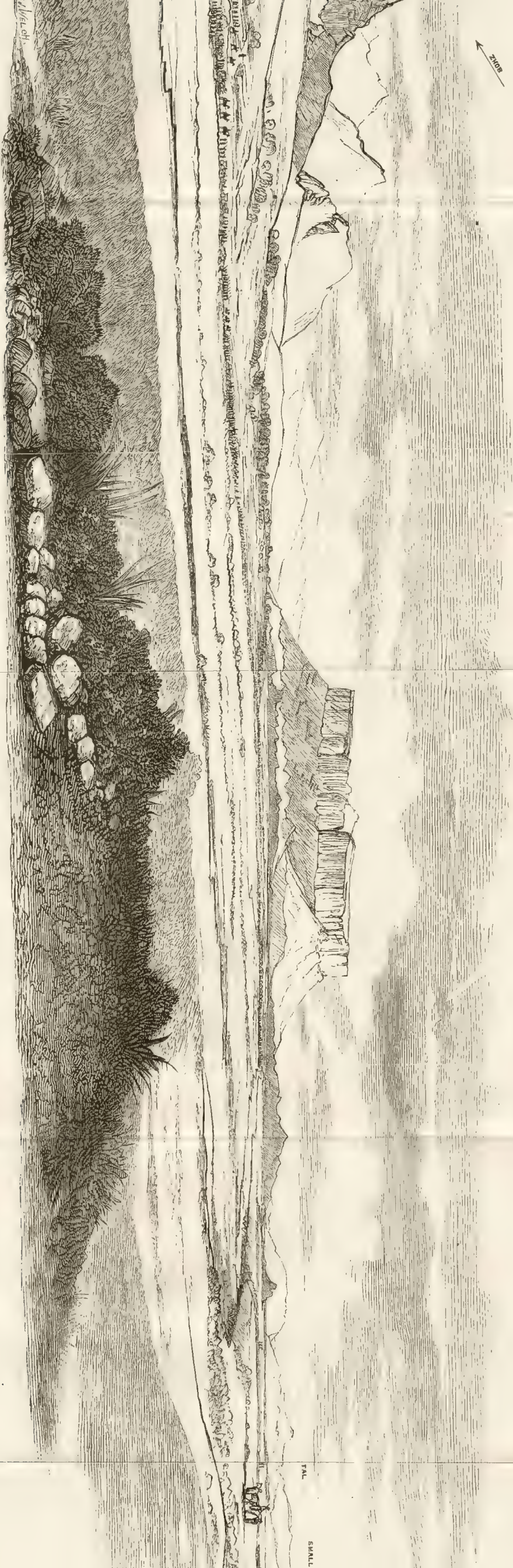
2. FROM PISHIN TO THE SULIMAN MOUNTAINS.

This paper would be incomplete if we were to omit to describe the discoveries made on the return march to India between Pishin and the Suliman Mountains. I propose, therefore, to describe shortly the leading features we met with.

At Ushtirrah Sirra, which it will be remembered is the water-parting of the Surkhab flowing to Pishin, we find the head of a drainage which eventually reaches the Nara or Sibi stream.

At five miles westward from the pass the valley we descend is met by a branch valley coming from the east, both valleys opening to each other, hemmed in on the south by the massive ridges of Mazwah and Spinskhar. The combined stream of the two valleys escapes in a southerly direction by a gap, a very abrupt feature, which is called Lehgut. Five miles from the junction the Pass of Momandgai is reached; elevation 8457 feet. Here we find the water-parting of a new drainage into the Borai Valley, which runs without a break by a uniform slope for 82 miles in a direction very nearly due east.

We must not, however, leave these highlands without remarking on the highly picturesque character of the country, particularly between the two passes. Mazwah and Spinskhar rise abruptly into grand rugged forms, having their lower slopes gracefully disposed and varied



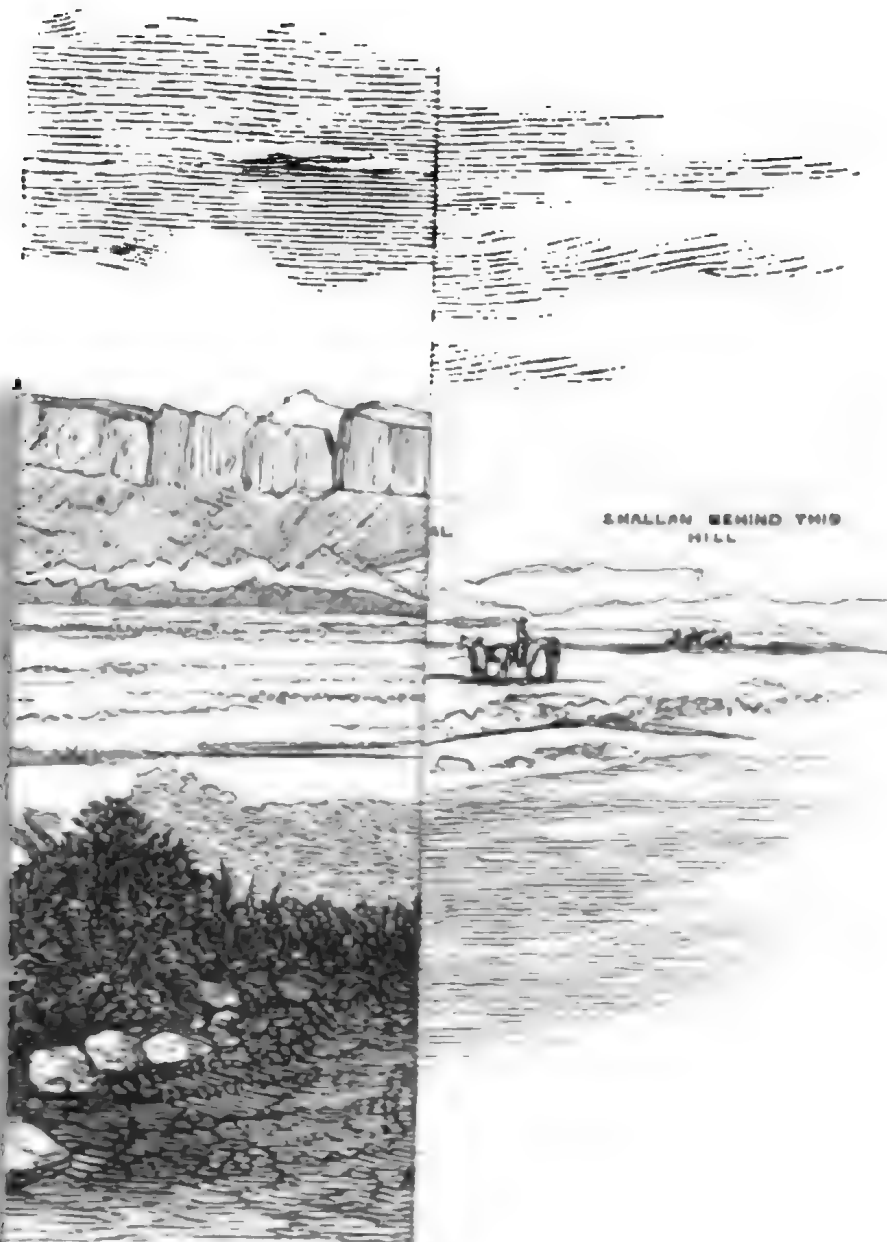
ON THE MARCH FROM OBUHTKAI TO CHIMAN.

FIG. 9.—MOUNT SIAZGAI, 8700 FEET.

FROM CAMP CHIMAN, LOOKING EAST. BORAI VALLEY TO THE RIGHT.
On the top of this hill there was in old times a post said to have been held by the Moguls.
Remains of tanks, cultivation, and ruined walls still exist.

TAL

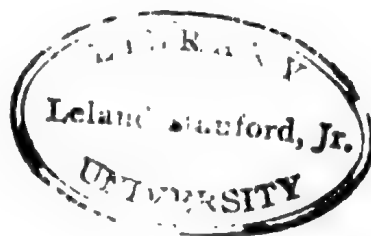
SMALL



SMALLAN BEHIND THIS HILL

CAMP CHIMJAN, LOOKING EAST

old times a post said to have been
cultivation, and ruined walls still



with a growth of cypress and other trees and shrubs (Fig. 10). In our travels we have not seen anywhere so luxuriant a growth. Momandgai is the division between Khorassan and India and also between the Panizai and Dumar sections of the Kakar tribe. The valley stretching to the

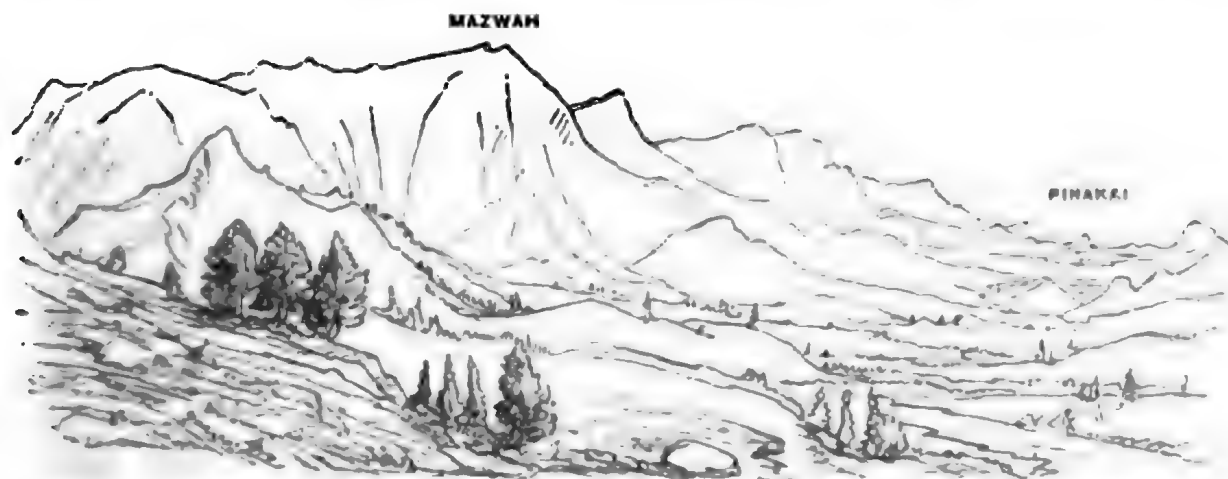


FIG. 10.—VIEW WESTWARD, ON MARCH TO DERAJAT, WATERSHED OF THE PINAKAI IN THE DISTANCE.

eastward, descending gradually, soon loses its wooded character, and the slopes and plains assume the bare aspect of the South Afghan landscape. At Obushtkai, $8\frac{1}{2}$ miles from the pass, the two bounding ridges are far apart; and at Chimjan, $5\frac{1}{2}$ miles further, the valley commences to be spread into wide plains.

Three miles to the east of Chimjan there stands the singularly-formed table mountain called Siazgai (Syajgai), which, rising well out in the plain, is a natural fortress (Fig. 9). There is here a meeting of plains and routes, and the locality has in the eyes of the people a great prestige and importance. In the old time the Moguls used the hill as a military post, and it seemed to us that it might again serve such a purpose. There is cultivation at Chimjan, and the fruit-trees and fields present a refreshing contrast to the wild hills and plain. Siazgai stands out in noble proportions as a principal object in this strange and yet grand landscape.

The offshoot from the so-called Western Suliman lying to the north of the Borai Valley divides it from Zhob. Another parallel limb separates Borai from Smalan, Tal, and Chotiali. Thus we find three great valleys having their origin in the highlands east of Pishin so disposed as to offer a choice of routes towards the Punjab. We never could have anticipated that this hitherto unexplored country would prove to be laid out so favourably for the routes we were in search of.

The lower portion of Borai is well watered, the villages are close together and well built, and to afford security against the attacks of the Marris, who sweep their marauding bodies up to this distant valley, every village is a little fort. Orchards peep above the enclosures, and fields extend from village to village. This fertile portion of the valley

stretches from Ningand to Sharan, and on to Chinai. The bounding ridge between Borai and Zhob has a most strange physical character. It is a huge glacis or whale's back, having cross parallel ridges on its surface, which are disposed like cross waves on an ocean swell. The lie of these ridges is about north-east and south-west. Between the ridges there are wide gaps and open passes into Zhob.

Now it must be understood that the Borai Valley has a length of about 100 miles of almost unobstructed plain, varying from five to ten miles in width. At Sharan the plain extends still in an easterly and a north-easterly direction; but the Borai River turns sharp to the south, finding an outlet through the Anumbar gap.

The stream draining Western Borai is called the Lorai, and that from the eastern valley Sahan, the two meeting in the Anumbar gap. The hills on each side forming the portals of the gap are abrupt and grand masses; the western hill is called Khru (Kuru), and the eastern Guddibar (Gadiwar). (Fig. 11.)

While we were in these localities we were informed of a route *via* Mekhtar and Karwadi which leads out to the Rakni Plain, avoiding the Barkhan Plain, following a direct line towards the Sakhi Sarwar Pass. Here also other important features were made known to us. Thus we were told that the Zhob Valley had a breadth of plain greater than that of Borai, and it was clearly explained that its outlet is towards the Galeri stream. We were also informed that due east from Sharan there lies an elevated plateau, to which the plains of Zhob and of Borai extend. In this dome-like mass, to which the natives give the name Sahara, are to be found the water-partings towards Zhob, Borai, Rakni, and the Vihova Pass. The Zhob Valley cannot, therefore, as represented in the recent edition of Walker's map of Turkistan, find an exit through the Suliman by the Vihova. When we were on the top of the Fort Munro Pass, on the Suliman, this feature of the Sahara Plain was pointed out to us looming in the distance, and we could see the Rakni Plain extending as far as the eye could reach in a direction towards it.

The physical character of the angle between Borai, Zhob, and the Suliman is most interesting, and ought to be cleared up at the first opportunity. The gap of the Anumbar is a most important feature. By it we were able to escape in the direction we wanted to go without attempting a more northerly and possibly more complicated line of country. We here open out on the Luni country, which is wide, level, and cultivated on the banks of the Anumbar. The valley trends to the south-west, and meets the Tal Chotiali Valley. The drainage area of this vast system of valleys is a very notable feature, as here are collected the floods which have occasionally swept over the Kachhi Plain.

We might have followed the Anumbar down to Chotiali, and thus have turned some of the rough country we now met with, but we



FIG. 11.—VIEW N.W. BY N. THROUGH THE ANUNBAR GAP. Zhob lies beyond the distant range of hills.

preferred to make a straight course for the Barkhan Plain via Trikh Kuram, Chimalang (Tsamaulang), and Bala Dhaka.

The country intervening between the Luni country and Barkhan is uninhabited, and a veritable debatable land. In it no man's life is safe. It is overrun by all tribes on its borders, viz. by Khetrans, by Lunis, and by Marris. There are here two valleys lying north-east and south-west, the Chimalang and that of Bala Dhaka. These valleys are bounded by three ridges; of these, the last, the Jandhran, is a long and formidable feature, and the only practicable path over it to Lugari Barkhan is by the Han Pass. This Pass was easily made fit for our passage, but it required careful loading of camels. We thought that a cart road or even a railway could be made over it by pursuing a more circuitous track.

The Khetran Plains, joining on to the Lugari Barkhan Plains, run along the eastern foot of the Jandhran Range; and the outlet from the Han and the debatable land is through the Han Durrah, a narrow gap 200 yards wide. At the foot of the Han there is, however, a more formidable gateway in an uplifted ridge of only a few feet wide. At the mouth of the Han Durrah stands the deserted town of Hasni Kot, abandoned some five years ago on account of the inroads of Lunis and Marris. The Barkhan-Khetran plains are open, well watered, and fertile, and they lead one to the other, presenting easy passages to the Chachar Pass to the south-west and to the Rakni Plain to the north-east. Arrived here, we found we had reached a friendly country—the Pathan tribes were left far behind—we were now able to relax some of the severe duties of watch and guard which had hitherto been so necessary to the safety of our columns.

The Suliman Range seen from the westward rises boldly above the Rakni Plain, and is a marked physical feature. Rothar at the foot, in the Rakni Plain, is 3617 feet high, and the point where we crossed is 6158 feet. The climate of the Suliman was in April most pleasant. On the border of Pishin we had snow in March, but down through Borai the weather was deliciously temperate, and spring was coming on. The fruit-trees were in bloom, and the corn an indescribable green. From a temperature of 40° to 50° we in one afternoon dropped down from Fort Munro to Zeradan, where we found the thermometer at 90° to 100°.

The country of the Derajat between the Suliman and the Indus is a rude jumble of old river beds and ridges, arid and hot with little verdure, which prepared us to enjoy the luxuriant trees and cultivation of Dera Ghazi Khan.

The Chachar Pass was found to present a more gradual descent than the Fort Munro route, and we thought it quite capable of being made passable for wheeled transport.

The appended section (Fig. 12) will enable the reader to understand

the gradients of the passes and the position and elevation of the plains between the Indus and the Kadanai Valley on the west side of Pishin.

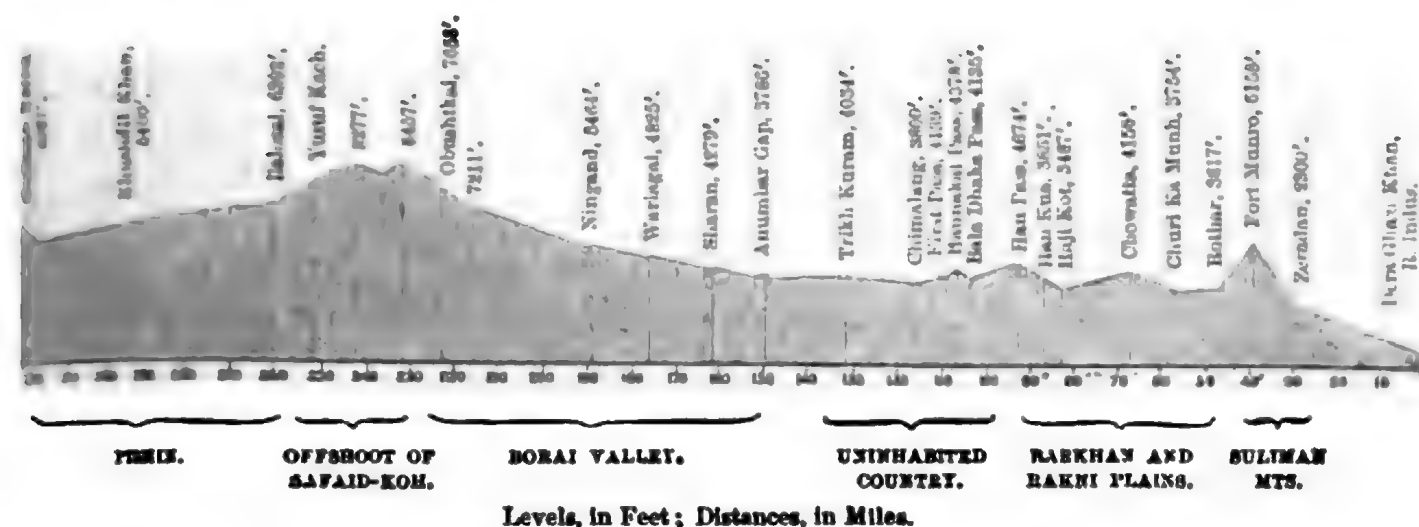


FIG. 12.—SECTION OF ROUTE FROM THE INDUS TO THE PLAINS OF PISHIN.

3. RAILWAY FROM SAKKAR TO CANDAHAR.

Since this paper has been in the press information has reached us of the completion of the railway from Sakkar across the plains of Kachhi to Dadar. This work is an accomplished fact, and we cannot but admire the energy with which the project has been carried into execution. All things considered, we believe that in the present situation it was absolutely necessary to choose this line, which at once connects the foot of the Bolan with our Indian system of railways. Whatever difficulties we may meet with in the future, consequent on the Indus floods on the one hand, and the outpour of water from the mountains on the other, must be overcome by suitable works and construction. As regards the Borai line, we think, after much weighing of the matter, that such a communication may be developed in the distant future; but in the meantime we possess what we immediately require, and at any cost the railway so far constructed must be extended to Pishin, and eventually to Candahar.

Dadar has an elevation of 750 feet, and the Bolan is a difficult route to the plains above. To avoid the Bolan, it is intended to divert the line up the Nara Valley by Sibi, and so gain the plains of Pishin at Gwal. We have no information of the exact direction of the line, but we know that the Ushmughzai Pass is the highest point on the water-parting between Sibi and Gwal, and its elevation is 6327 feet. The distance between Dadar and the passes into the basin of the Loras it may be possible by following the sinuosities of the country to spin out to 120 miles, but in this instance it will be necessary to surmount the 5500 feet difference of level.

There are three passes over which it may be possible to conduct the railroad, but in the present state of our geographical knowledge we cannot as yet know what may be decided on. The Hunna and Sura Khwulla

lead into the Shalkot or Quetta plain. The Ushmughzai Pass leads direct on Gwal by the Sagarband defile. We have some idea that the choice will fall upon the latter.

Once Gwal is reached, it is probable the line will follow the loop of plains by Khanizai, and descend into the great Pishin Plain at Killa Khushdil Khan, which is an important point. From here the road along the Daman offers a line free from the obstructions of the many nullas of the Lora, which would be met with in taking a more direct line from Kujlak to Gulistan Karez, at the foot of the Gwaja. Thus, to sum up the difficulties to be met with, we find the most serious are that of the rise from Sibi over the lip of the Lora basin—whether it be by the Hunna, the Sura Khwulla, or the Ushmughzai. The plains of the Loras having been entered on, no obstacle of note presents itself till it arrives at the Khoja Amran. From the Khoja Amran to Candahar there are continuous plains, the principal obstructions being the numerous cross streams, which would require bridging, and wide water-ways.

In introducing Sir Michael Biddulph to the Meeting, prior to the reading of his paper :—

The PRESIDENT said there was perhaps no part of the world which, during the last two years, had attracted more attention from Englishmen than Afghanistan and the neighbouring countries. He felt it a great pleasure to have to introduce to the members Major-General Sir Michael Biddulph, an officer whom he had known well, and for whose character and professional merits he had a very high esteem. The Geographical Society had one privilege which was not possessed by many other meetings of Englishmen, and that was that they could talk about Afghanistan and its position without entering into any matters of political controversy. Whatever differences might exist with respect to other points, he was sure there would be none in any assembly of Englishmen about the recognition of the enterprise and gallantry of the officers and men both of the British and native forces who had been engaged in that country. Although Sir Michael Biddulph had not had what soldiers consider the advantage of any very severe actions, yet he and the forces with which he was connected had made longer marches, and probably had to suffer greater hardships than any other troops engaged in the expedition. But the present was not the proper time or place in which to go into questions about the operations of the army. What the Meeting had to deal with was the scientific result to geography, from the progress of the troops through countries which heretofore had not been accessible to Englishmen. Sir Michael Biddulph with his force went further than any other part of Sir Donald Stewart's troops, namely, to the River Helmund. He had the advantage of being an excellent draughtsman, and was probably better qualified than any other officer in his position to give a geographical account of the country which he traversed. The Meeting would, therefore, at the conclusion of the paper, be able to judge for themselves the value of the opinion which he (the President) had given as to Sir Michael Biddulph's merits.

After the paper, the President called upon Sir Henry Rawlinson to speak, as the highest authority present, upon the geography of Afghanistan.

Sir HENRY RAWLINSON said he was afraid he should not be able to furnish the Meeting with any new or interesting information on the country which Sir Michael Biddulph had described, since in his own passage through that part of Afghanistan he was unable to deviate more than a very little from the beaten track. However,

he was glad of this opportunity of offering his testimony, such as it was worth, to the great value of the information which General Biddulph had placed before them that evening. He remembered, not very many years ago, at one of the Society's meetings, Colonel Macgregor, who was now chief of the staff at Kabul, brought strongly before the members the fact that at that time Englishmen knew more of the interior of China, or even of Africa, than of the countries on the Indian frontier. That was a reproach which could not now be attached to them. All geographers must have been delighted to see that during the recent operations in Afghanistan the sextant and the theodolite had been borne alongside the Gatling and the Martini-Henry. The results thereby obtained were not merely for the present day, but for the benefit of future generations, for geographical knowledge once acquired was acquired for all time. It was not a mere dilettante acquisition: it was utilitarian in the broadest sense, leading to commerce, and an improvement of the means of communication, and was a necessary preliminary to the civilisation of any country. It was upon those grounds that he ventured to impress upon the meeting the extreme value of the service which General Biddulph had performed. As had been stated in the paper, the country which had just been described had previously been unexplored by any European. Across it on the maps was formerly written "Unexplored." It was true that from native authorities a certain amount of information about it had been obtained. Major Raverty, who was one of our first, if not our only advanced Afghan scholar, had recently translated some very valuable memoirs in reference to this particular country, and presented them to the Indian Office. They would be of great interest to General Biddulph when compared with the result of his own explorations. The country between Pishin and the Valley of the Indus was traversed on one occasion by Baber Padshah, when he returned to Ghazni from Dera Ghazi Khan; and on another occasion by Dára Shekoh, the elder brother of Aurangzebe, when he led an army from the Valley of the Indus almost in the very line which General Biddulph followed, direct to Candahar, along the Borai Valley. If it was not the actual route it was parallel to that taken by General Biddulph's column. But there was no European in Prince Dára's force, and there was no attempt at surveying. All that was obtained was a barren list of names with a general description of the country, which really was of no use to practical geographers. He now proposed to notice one or two points that might be of interest to geographers in general. The district above the hills which General Biddulph had described, was in times comparatively ancient, namely, during the early Moham-medan period, a district of very great wealth and consideration. It stretched from Shorawak, including Pishin and Sibi, and took in all the western skirts of the hills. It was called *Bálísh* or *Válísh*, from a tribe of Turks who in the ninth or tenth century passed from the vicinity of Ghazni and colonised the country in question. They left their name in the district of Malistan, near Ghazni, where it remained to the present day.* They built several considerable towns, and for two or three hundred years maintained a certain degree of celebrity. Their name had since vanished from the country, and the towns which they founded were now in ruins. Their capital was *Ispenjwái*, or "the White District," and according to his view was the same as Shorawak, "the Salt District," which was in fact an equivalent name. Pishin was called *Afshínch*. Quetta appeared under the name of *Shal*, which it retained to the present day. The tradition of the country asserted as an explanation

* In the time of Hienou-tsang (7th century A.D.), Fo-li-shi-sa-tang-na (*Valishistán* or *Valistán* of the Arab geographers, i.e. country of the *Valísh*) comprised apparently the upper valleys of the Helmund, the Arghendáb, and the Tarnak, the capital, called by the Chinese Hou-pi-na = Greek Cophen, being at the site now known as *Ulan-robát*. In the following century the *Válísh* moved south-westward to *Pishin*;

of the name "*Shal*," that on the institution of the Afghan monarchy, the district of Quetta was assigned by the Duráni king in fief to the Khan of Khelat, on payment of a yearly offering of a shawl, and until lately he had always supposed that was the real origin of the name, but the tradition now proved to be untrue, since he had found that the place was called *Shal* as early as the tenth century. *Shalkot* had been mentioned by General Biddulph. *Kot*, he believed, was merely "the court-house," and Quetta was certainly a corruption of *Kot*. The other places named by the geographers in that district were *Mustang* and *Sibi*, and last of all *Sukíreh*, of which he did not know the position. He hoped that some day, when the country was more tranquil, the mounds in the Pishin Plain would be excavated. Some traces might then be found of the old Turkish tribe of *Válísh*, and of the coins which they used. He regretted that General Biddulph had not extended his paper a little, because he was the only senior officer of the expedition who penetrated far to the west. He had led an expeditionary column, indeed, across the Helmund, and if he had given a short account of the banks of that river, and of the ruins of Kileh-Bíst, Bendi Timour, and other remarkable places in that vicinity, it would have been very interesting. However, what the paper contained was all new and valuable. All present would also have been gratified if he could have given a trace of the railway which was now in course of formation from the Indus to Candahar. He ventured to offer an opinion that that line and the other one on the east side of the country would probably be the two most valuable products of the Afghan war. In such countries, indeed, railways must be especially valuable, not only for purposes of military transport, but also in the larger interests of civilisation and commerce. As far as he (Sir Henry) knew at present, it appeared that the railway would ascend the mountains by *Sibi*, and not by Dadar and the Bolan Pass; it would then follow up the Nara River, and enter upon the plateau at Gwal. He believed it was intended to establish a large station at a place called Hurnai, near the head of the Nara, on the slope of the hills, above the hot plains of India, and yet not quite on the level of the plateau of Afghanistan. At that point it was also in contemplation to alter the railway from the broad to the narrow gauge. He would not at present risk reviving the old battle of the gauges, though he confessed he had an extreme horror of a break in the gauge, both as a military man and with a view to commerce. It was, in his opinion, the greatest misfortune that could happen to a railway. Still if, on economical grounds, there was no alternative, it must be put up with. Perhaps on some future occasion General Biddulph might be able to continue his observations on this interesting subject.

Sir WM. MEREWETHER said that in speaking of the communication between the Pishin Valley and India, General Biddulph had pointed out that the region he had explored was one of the old *kafila* routes for caravans. It was formerly a well-frequented route, but latterly had been abandoned, partly in consequence of the hostility of the tribes. There was, however, a very strong reason why it had not been followed of late years. In earlier times the capital of the Empire of Hindostan was Delhi, and naturally the products of Central Asia followed the shortest possible route to reach that city,—through Dera Ghazi Khan to Multan, and so on to Delhi. The capital of the Empire was now, however, London, and the consequence was that trade inclined more to the south, towards the nearest seaport, and followed the Bolan Pass. Even before the Empire of India became as it now is, it went by the latter route, because traffic would always take the shortest and most speedy way to its market, which now unquestionably was the sea coast. The seaport of Afghanistan was Karáchi. Since 1861, when Sir Bartle Frere first started the harbour works there, great improvements have been made at that port, and the harbour now was the only practicable one on the west side of India, except that at Bombay, which of course it was impossible that it could equal. It

would no doubt be largely frequented in order to obtain the valuable commodities which would come down from Afghanistan when matters were settled in that country,—a state of things which, without encroaching on politics, all would agree with him in wishing might take place in a very near future. The River Indus was also a great advantage to the trade. Since 1839 steamers had been working on that river carrying the products up and down. In 1861 a railway was opened from Karáchi to Kotra opposite Hydrabad, connecting the Indus with the Port. More recently the railway communication had been extended up to Sukkur, which was on the right bank of the Indus, opposite Rori. It was part of the railway which was very aptly styled the “missing link.” That link had now been completed, and there was railway communication from Karáchi right around to Calcutta. Lately a branch had been made from Sakkar (Sukkur) to Sibi. That was begun only at the end of last year, but it was now finished up to the commencement of the hills where the Nara River leaves them. The amount of energy and enterprise displayed in the execution of that railway could not be too highly extolled. More than a mile and a half had been laid per diem—a rate which was almost equal to some of the performances across the Atlantic. Having reached that point the question was whether the railway should be taken up the old route of the Bolan, or from Sibi up the valley of the Nara. All those mountain passes were river courses descending from high levels, and it was necessary to carefully examine the banks right up to the springs, or serious barriers might otherwise be encountered. The Bolan and the Nara ran quite parallel to each other, but the surveyors who were started from General Biddulph’s column at Pishin found that the route by the Nara was a more gradual ascent, and at the end attained such a height that it would be more easy to get on to the plateau. The disadvantages of the Bolan were that at two points in the pass the route was very narrow, and when the water rose, it might come down with excessive force and carry everything away. For that reason he believed it had been decided by the Government of India to adopt the Nara line. As Sir Henry Rawlinson had stated, it was considered advisable to make the first part of the line broad gauge up to Hurnai. He considered that that was the proper thing to do. He had himself spent a year at Sibi, and he could safely say that it was without exception the hottest place he was ever in, and he never wished to see any large body of people placed there. An old proverb about Sibi was that so long as it was in existence there was no necessity for any hotter place. It would, therefore, be easily imagined that it would not be a good spot to which to consign Europeans. The broad gauge was at present expected to stop at Hurnai, but he hoped that such would not be the case, and that at any rate it would be carried on as far as Candahar, where the gauge might be broken for the present. During the time that he had been in Sind, over thirty years, he took the greatest interest in inquiring into the commerce that came down by the Bolan and other routes. A few days ago he had looked at some of his notes, and he found that in one year the wool alone brought down from Afghanistan amounted to sixty lacs of rupees—600,000*l*. In addition to that there were dyes, silks, and—what the poor, thirsty souls of Sind regarded as better than all else—exquisite fruits. Although for the present the railway was regarded as a military measure, it would, he hoped, before many years had passed, prove to be an exceedingly good commercial undertaking. It might not perhaps be a good investment for Englishmen’s spare money, but he felt sure that it would yield some returns, and as trade gradually developed, would, in the end, pay a handsome dividend. He had been commissioned by the President to ask the Meeting to pass a vote of thanks to General Biddulph for the excellent paper which he had read, and for the valuable addition which he had contributed to geographical knowledge, and this he had much pleasure in doing.

Sir HENRY THUILLIER said he regretted that he had no practical knowledge of Afghanistan, because he had never been allowed to cross the frontier, but he had much gratification in testifying to the advantage which the officers of his old department in India derived from being under such an admirable general as Sir Michael Biddulph. He had it from the authority of the officers themselves, that the encouragement which they received from General Biddulph enabled them to do far more than they otherwise could possibly have done; and, in fact, the column under that General had done more surveying work than any other in Afghanistan. The Society must therefore feel truly grateful to a General who, amid all the responsibilities and arduous duties of his position, could think of the surveyors and send them out at every possible moment. He had received from India a map called "The Two Routes into Afghanistan, *viâ* Jalalabad and *viâ* Kurram." The map had not reached the Geographical Society from the India Office, but explorers in London had been able to ferret it out, and it was now on the table. It showed the large extent of new work executed by the survey officers during the present campaign, in contradistinction to what was before known; and it proved, as remarked by the President, that great modifications would be necessary in the map of Afghanistan. When Major Browne went out in 1877, before the war commenced, with the idea of laying a telegraph line to Khelat, he was furnished with all the information then obtainable with regard to the position of places and routes from Sind to the frontier, and he attributed to the data which were then furnished, much of the value of the work which the surveyors had been able to do by extending their triangulation from the Sind side, and by various other operations. The names of the officers who had so zealously performed their duty with the several columns were Major Maxwell Campbell, R.E., Captain Holdich, R.E., Captain Heaviside, R.E., Captain Woodthorpe, R.E., Captain Rogers, R.E., Captain Chas. Strahan, R.E., Major Tanner, Captain Gerald Martin, Lieutenant Hobday, Lieutenant Gore, R.E., Captain Beavan, and Lieutenant E. P. Leach, R.E., who was gallant enough to win the Victoria Cross and a brevet majorship. That was not a light thing to do whilst surveying a country. The Survey Department in India, when employed in an enemy's country, and beyond our frontiers, was not confined to military officers, and a civil officer, Mr. Scott, had performed most gallant deeds, on two occasions, worthy of the Victoria Cross. He believed his merits were now under the consideration of the Government and Council of India, and he hoped most sincerely that they would meet with the reward which they deserved. He had great pleasure in seconding the resolution for a vote of thanks to General Biddulph for the assistance he had given to topography and geography.

GEOGRAPHICAL NOTES.

Professor Nordenskiöld.—The celebrated Swedish explorer left Lisbon in the *Vega* on the 16th of March, with the intention, as we were informed, of paying a short visit to England on his way to Stockholm. He was expected to arrive at Portsmouth on the 22nd or 23rd; and arrangements were immediately made for giving him a suitable reception—at least such arrangements as were practicable at the season in which his visit was timed, i.e. the commencement of the Easter holidays. A deputation from the Society was appointed to receive him at Portsmouth, consisting of Sir George Nares, Commander Beaumont, and other Arctic officers, headed by Admiral A. P. Ryder; and a dinner in his honour,